

Date: Monday, 23/02/2009 10:13:18 AM
 User: Julie Dawson

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : MID TUBE ASSEMBLY
Job Number : 45960	
Estimate Number : 10469	
P.O. Number :	Part Number : D3391023
This Issue : 23/02/2009 S.O. No. :	Drawing Number : D3391 REV H
Prsht Rev. : NC	Project Number : N/A
First Issue : / / Type : SKIDTUBES	Drawing Revision : H
Previous Run : 44077	Material :
Written By :	Due Date : 10/03/2009 Qty: 1 Um: Each
Checked & Approved By : <u>JUD 09.02.03</u>	
Comment :	
Est. A 05.10.20 New Issue KJ/EC	
Est. B 06.02.10 ECN773 dwg rev.D EC	
est C 07.03.20 rev F dwg EC	
est D 07.03.28 re-format EC	
est E 07.10.31 ecn 1053P EC	
Est Rev:F ECN 1056 07-11-13 DD verified by: EC	
Est Rev:G 08-09-08 new process (ecn 08-510) DD verified by:EC	
Est Rev:H 08-09-10 revH as per dwg DD verified by:EC	
Est Rev: I 08-11-13 Removed steps per w/o, QC KJ verified by: ec	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D25001100	Skidtube Extrusion
-----	-----------	--------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
 SKIDTUBE EXTRUSION

Pick:

Qty.	Part Number	Description	Batch
	<u>[REDACTED]</u>	Extrusion	<u>B32065 DP 9-2-26</u>

2.0	D3391021	Fwd Tube Assembly
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Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)
 Fwd Tube Assembly
 Batch: B 459540 11 a-3-5

3.0	SKIDTUBES 1	SKIDTUBE RESOURCE 1
-----	-------------	---------------------



Comment: LANDING GEAR RESOURCE 1
 1-Cut tube to finish length as per Dwg D3391

2-Identify as D3391-023

3-Drill pilot holes using DT8796 (Do not drill "B" holes) and drill only 1 fwd saddle hole on one side only as

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Monday, 23/02/2009 10:13:18 AM
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Part Number: D3391023

Job Number:



Seq. #:

Machine Or Operation:

Description :

per Dwg D3391

4-Open saddles and GHW holes to Ø0.375" exopt for fwd saddle hole of detail "J"

5-Remove .030" from Fwd indexing Ridge as per Dwg D3391

6-Remove indexing ridge on Fwd & Aft end of skidtube as per Dwg D3391

7-Deburr

8-Drill #30 pilot holes using wearplate Jig DT8217 Identify Ø0.250" holes with paint marker,

9-Open wearplate holes of D3391-023 assembly detail section G-G to Ø0.250" (14 holes) as per Dwg D3391 and 2 holes in section Detail "J", do not open wearplate holes of section "J"

10-Open wearplate holes of D3391-023 assembly detail section H-H to Ø0.297" (20 holes) as per Dwg D3391

11-Open .375" holes to .438" ***do not open fwd saddle holes***

12-Locate D3391-021 in D3391-023 at 9.00" (see view z-z)

13- Transfer drill one fwd saddle hole only to .188" dia, transfer drill all remaining fwd saddle holes using DT 8149 locating from previously drill .188" dia hole, using t-pins and clicos to ensure perfect allingment, open up previously tranfer drilled pilot holes in D3391-023/-021 to 0.438" dia. in D3391-021

14- Transfer drill 2 wearplate holes into D3391-021 using DT8217, locating from two previously drilled holes, drill remaining wearplate holes into D3391-021.

15- Locating from two fwd wearplate holes drilol remaining 6 wearplte holes in D3391-021 using DT8937

16- Open 2 fwd wearplate holes in D3391-023 to .250" dia.

17- counterbore two aft wearplate holes in D3391-021 as per dwg

18- Open 12 wearplate holes in D3391-021 to 0.297" dia.

19-Deburr and blow out all chips from inside tube

4.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3391-023 PAR #: _____ Fault Category: _____ NCR: Yes (No) DQA: D Date: 09/04/15
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: <u>45960</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
<u>090309</u>	<u>3.16</u>	The 4 fuel wear plate holes were opened up to 0.297 (was the rest). R.C. Employee error.	<u>[Signature]</u> <u>09/03/09</u>	Acceptable. Ensure to immediately block tape off the holes next time so they don't get opened.	<u>[Signature]</u> <u>9-3-9</u>	<u>[Signature]</u> <u>090309</u>	<u>[Signature]</u> <u>09/03/09</u>	<u>[Signature]</u> <u>090309</u>

NOTE: Date & initial all entries

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Job Number: 45960

Part Number: D3391023

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



①

AWM 9-3-11

Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

6.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

① H 9-3-11

7.0



Web



①



Comment: Qty: ~~1.0000~~ Each(s)/Unit Total: 1.0000 Each(s)

WEB

Pick:

Qty

Part Number

Description

Batch

1

D3389-1

Web

B44090

M 9-3-11

A/R

Sikaflex-241/-291

M109883

Sikaflex expire date: 9-7-11

Start: 9-3-11 Time: 3:00

Finish: 090312 Time: 8:30AM

8.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Open float bag holes as per dwg

2-C'sink float bag holes as per dwg

3- Prepare tube for welding

4-Bond web in place as per Dwg D3391 & QSI 015.

Adhere for 12 hours)

H 9-3-11

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

9-3-12 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Job Number: 45960

Part Number: D3391023

Job Number:



Seq. #:

Machine Or Operation:

Description :

10.0

D36811

Spacer



Comment: Qty.: 5.0000 Each(s)/Unit Total : 5.0000 Each(s)

SPACER

batch

BE 9/03/12

(5)

11.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Weld crossbolt spacer as per dwg D3391 & QSI 004

2-grind weld flush

09-03-12

A/R M110676
BE 9/03/12

12.0

QC10

VISUAL INSPECTION OF GROUND WELDS



Comment: VISUAL INSPECTION OF GROUND WELDS

S 080401

(X)

13.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 080401

(X)

14.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING pressure wash 09-04-01

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

M110939

START TIME:

4:00

OVEN TEMPERATURE:

320°

FINISH TIME:

4:30

BE 09-04-01

(1)

15.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

09-04-02

(X)

16.0

D35911

Bushing



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bushing

B43172

09-04-02

(X)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Job Number: 45960

Part Number: D3391023

Job Number:



Seq. #:

Machine Or Operation:

Description :

17.0

SKIDTUBES 1

SKIDTUBESS RESOURCE 1



Comment: SKIDTUBESS RESOURCE 1

✓ 1- insert D3391-021 into D3391-23

✓ 2- insert T-pins into first and third fwd saddle holes

✓ 3- ON FIRST SIDE ONLY drill out 2nd and forth fwd saddles holes to 0.500" as per DSI 9364

✓ 4- remove T-pins and locate DT9415 from first and third crossbolt hole using T-pins and clekos

✓ 5- ON 2ND SIDE ONLY ream out 2nd and forth saddle hole to 0.499". Remove DT9415

✓ 6- deburr, re-alodine and blow out chips

✓ 7- press fit D3591-1 spacers using DT9416 starting from 0.500" side

MS 09-04-02 (X1)

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 09/04/02 (X2)

19.0

ALS41032130

Insert



Comment: Qty.: 22.0000 Each(s)/Unit Total : 22.0000 Each(s)

INSERT

batch: M108606

or equivalent

per QSI 017

* MS

20.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Install Inserts as per Dwg

MS 09-04-02 (X1)

21.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 09/04/06 (X2)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Drawing Name: MID TUBE ASSEMBLY

Job Number: 45960

Part Number: D3391023

Job Number:



Seq. #:

Machine Or Operation:

Description :

22.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

PP 46600 P 9/4/9 C

23.0

QC21

FINAL INSPECTION/W/O RELEASE



09/04/13

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



mf 09-04-09

Dart Aerospace Ltd

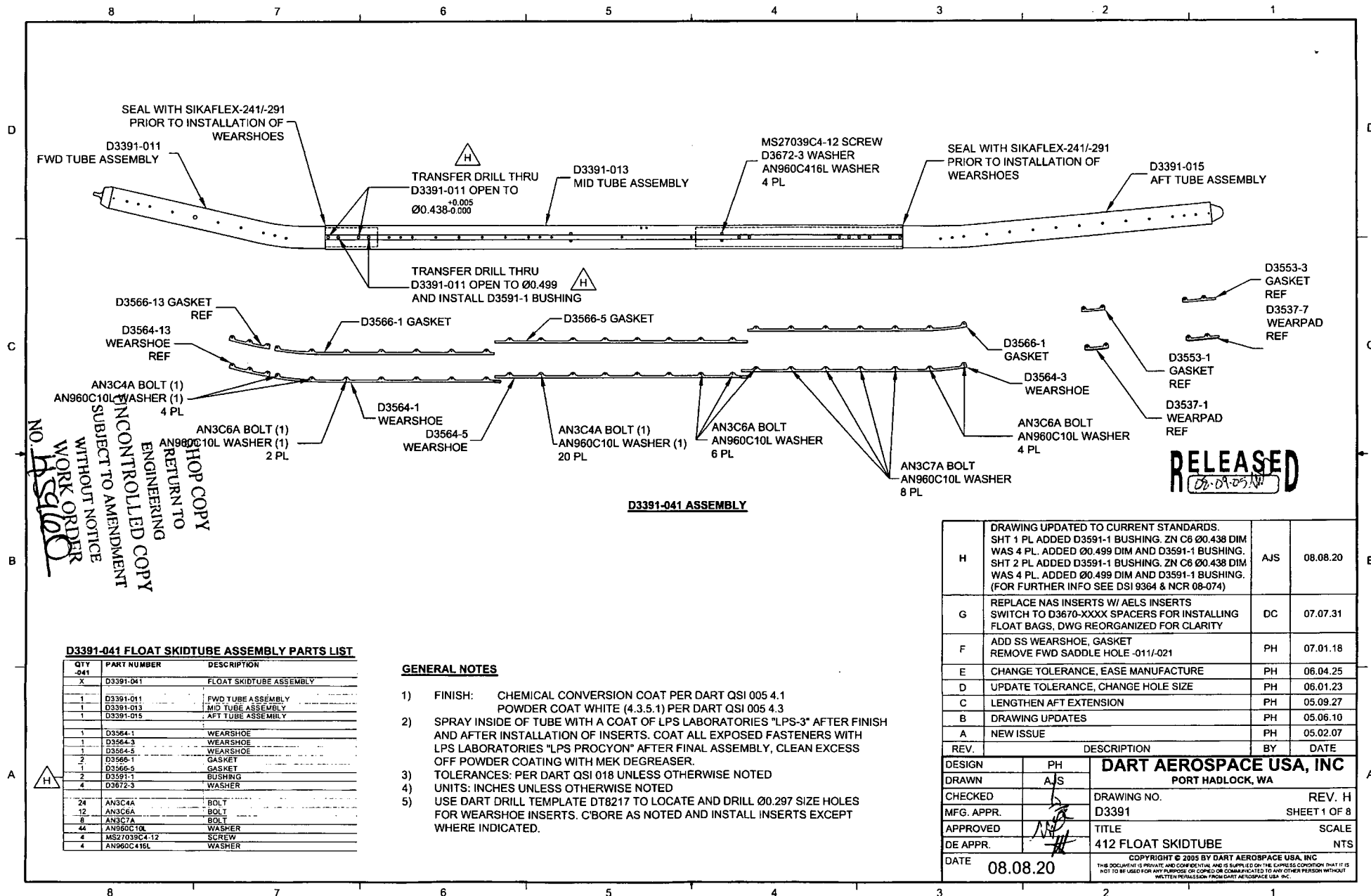
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

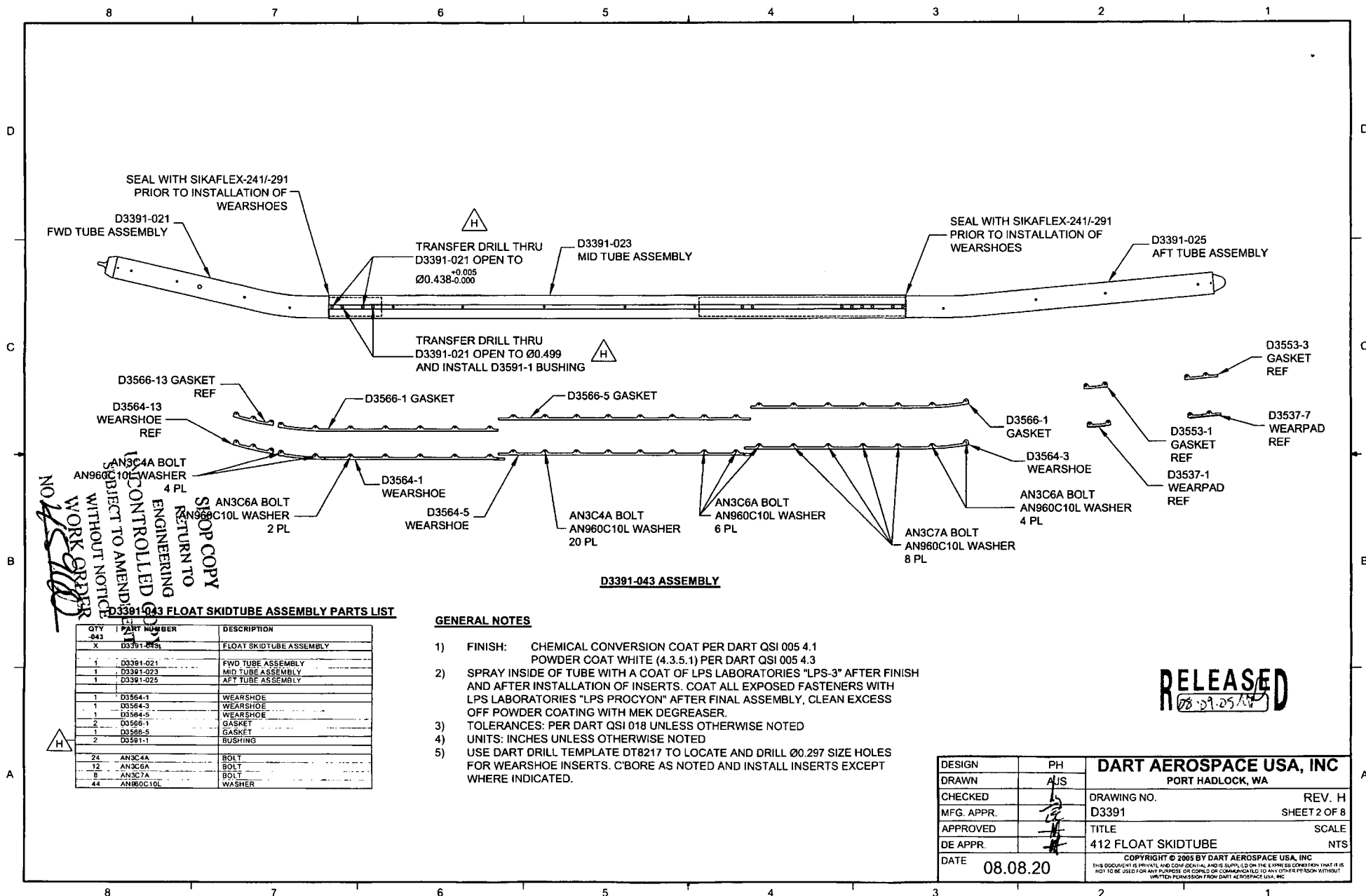
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries





D3391-043 ASSEMBLY

D3391-043 FLOAT SKIDTUBE ASSEMBLY PARTS LIST

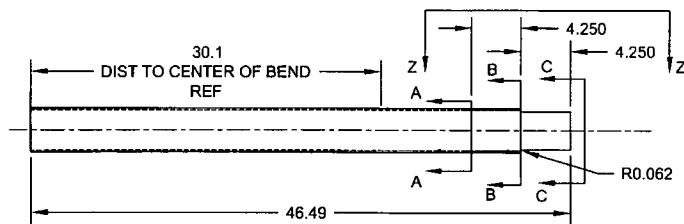
QTY	PART NUMBER	DESCRIPTION
1	D3391-043	FLOAT SKIDTUBE ASSEMBLY
1	D3391-021	FWD TUBE ASSEMBLY
1	D3391-023	MID TUBE ASSEMBLY
1	D3391-025	AFT TUBE ASSEMBLY
1	D3564-1	WEARSHOE
1	D3564-3	WEARSHOE
1	D3564-5	WEARSHOE
2	D3566-1	GASKET
1	D3566-5	GASKET
2	D3591-1	BUSHING
24	AN3C4A	BOLT
12	AN3C6A	BOLT
8	AN3C7A	BOLT
44	AN960C10L	WASHER

GENERAL NOTES

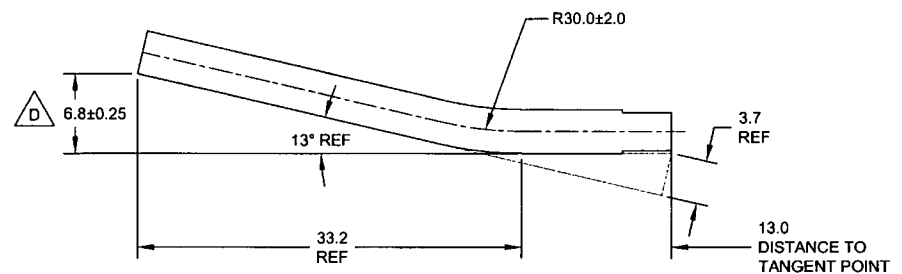
- 1) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 2) SPRAY INSIDE OF TUBE WITH A COAT OF LPS LABORATORIES "LPS-3" AFTER FINISH AND AFTER INSTALLATION OF INSERTS. COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON" AFTER FINAL ASSEMBLY. CLEAN EXCESS OFF POWDER COATING WITH MEK DEGREASER.
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 SIZE HOLES FOR WEARSHOE INSERTS. C'BORE AS NOTED AND INSTALL INSERTS EXCEPT WHERE INDICATED.

RELEASED
08-09-25/14

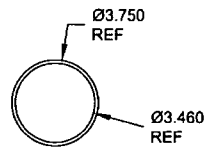
DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	AUS	PORT HADLOCK, WA	
CHECKED		DRAWING NO.	REV. H
MFG. APPR.		D3391	SHEET 2 OF 8
APPROVED		TITLE	SCALE
DE APPR.		412 FLOAT SKIDTUBE	NTS
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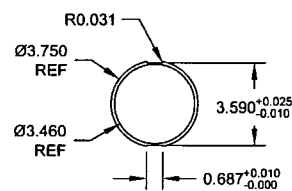
D3391-1 CUTTING DETAIL
(MAKE FROM D6013-047 SKIDTUBE MATERIAL)



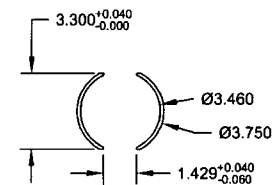
D3391-011/-021 BENDING DETAIL
(MAKE FROM D3391-1)



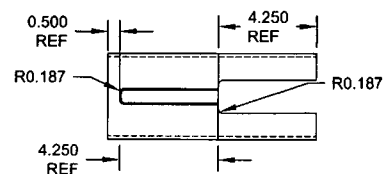
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SECTION B-B
SCALE 2X






SECTION C-C
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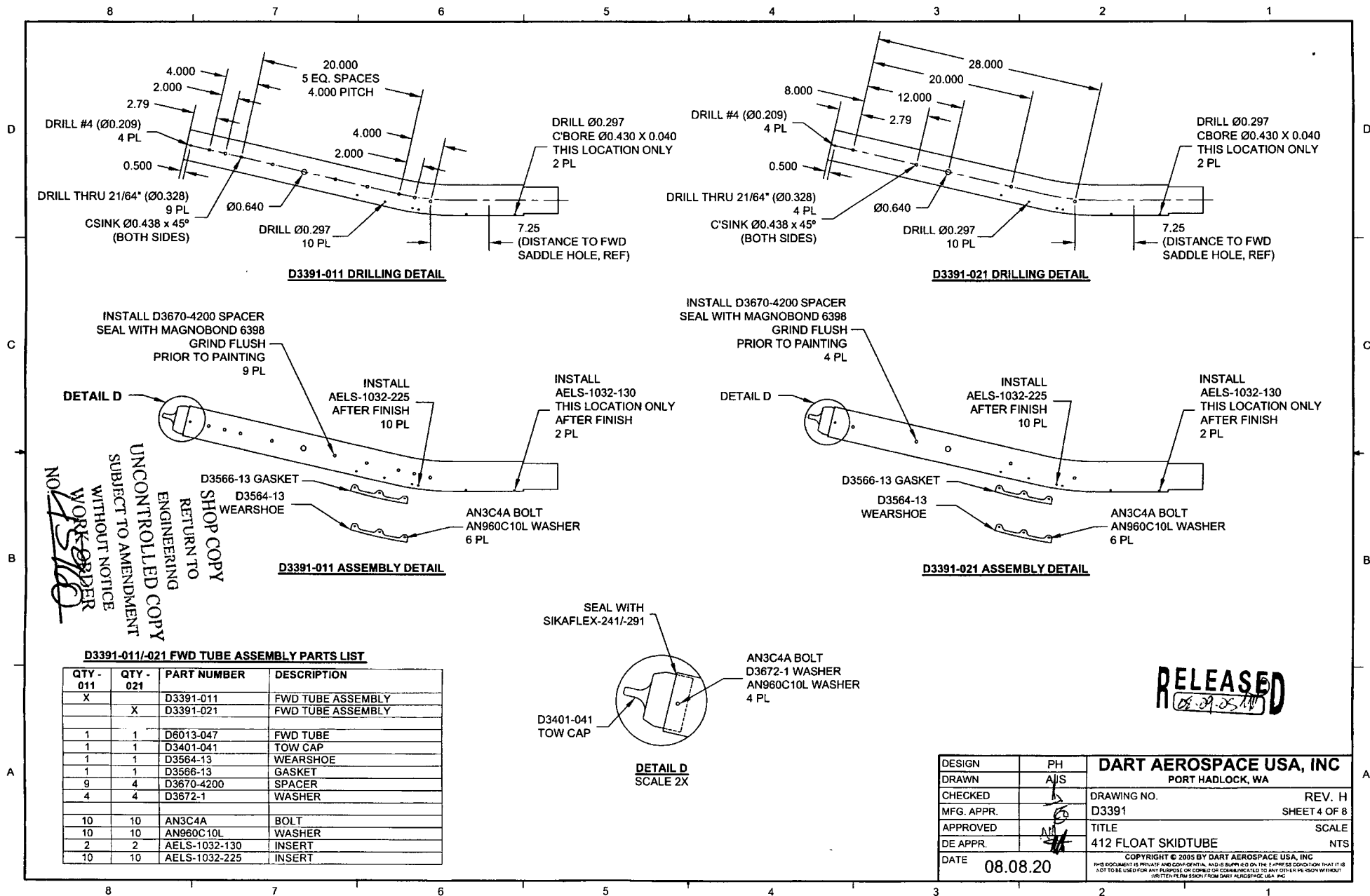


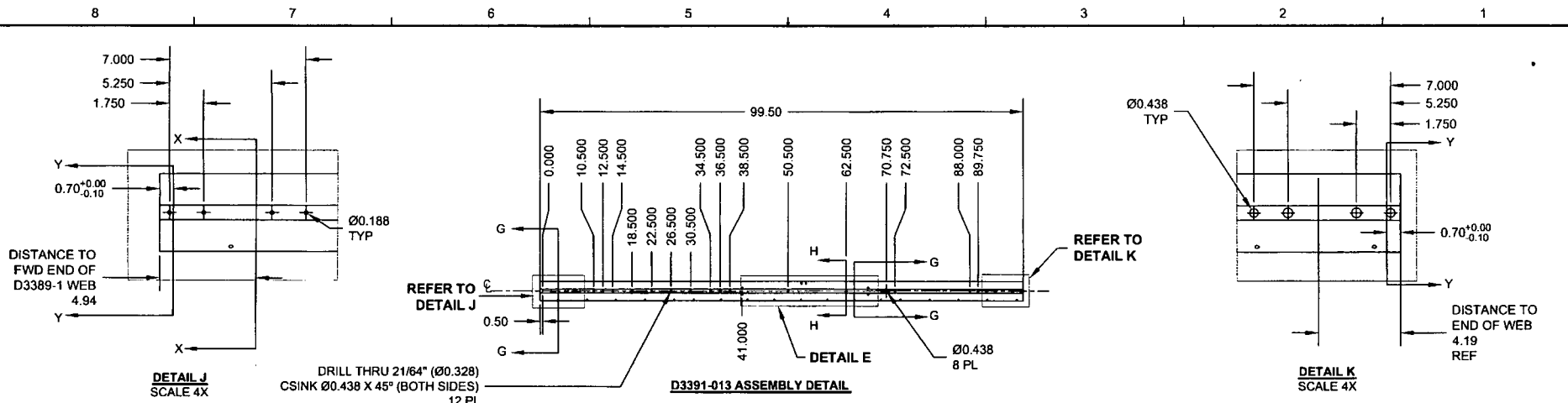
VIEW Z-Z
SCALE 2X

SHOP COPY
RETURN TO
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 759100

RELEASED
28-05-11

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DRAWN	AUS	PORT HADLOCK, WA	
CHECKED		DRAWING NO.	REV. H
MFG. APPR.		D3391	SHEET 3 OF 8
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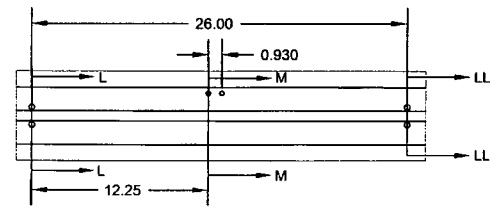
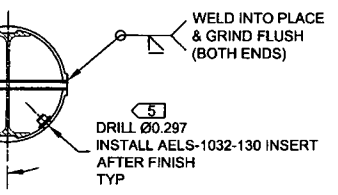
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 ENGINEERING
 WITHOUT NOTICE
 WORK ORDER
 No 4544

D3391-013 MID TUBE ASSEMBLY PARTS LIST

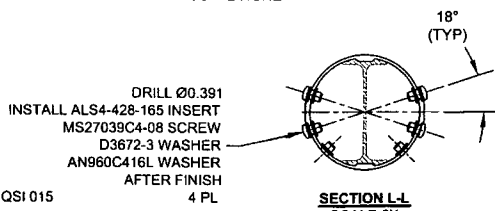
QTY	PART NUMBER	DESCRIPTION
-013		
X	D3391-013	MID TUBE ASSEMBLY
1	D2500-1-100	EXTRUSION
1	D3389-1	WEB
4	D3672-1	WASHER
4	D3672-3	WASHER
12	D3681-1	SPACER
24	AELS-1032-130	INSERT
4	ALS4-428-165	INSERT
4	AN960C10L	WASHER
4	AN960C416L	WASHER
4	MS27039C1-09	SCREW
4	MS27039C4-08	SCREW

D3391-013 MID TUBE ASSEMBLY

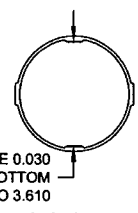
- 1) MATERIAL: MAKE FROM D2500-1-100 EXTRUSION
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/291 PER QSI 015
- 3) WELDING: PER DART QSI 004



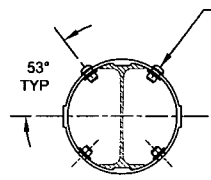
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SCALE NONE



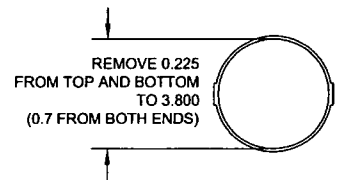
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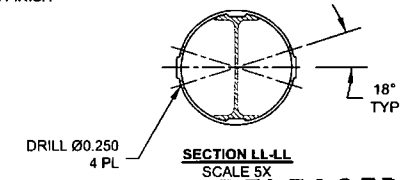
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SCALE 5X



SECTION M-M
SCALE 5X



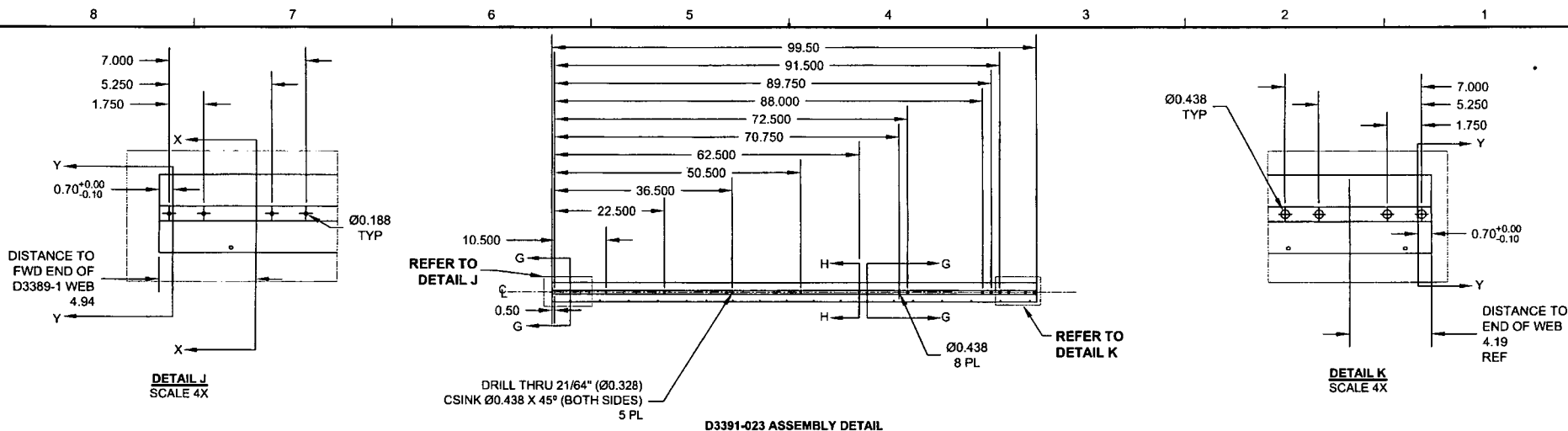
SECTION Y-Y
SCALE 5X



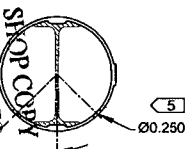
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DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	AJS	PORT HADLOCK, WA	
CHECKED		DRAWING NO.	REV. H
MFG. APPR.		D3391	SHEET 5 OF 8
APPROVED		TITLE	SCALE
DE APPR.		412 FLOAT SKIDTUBE	NTS
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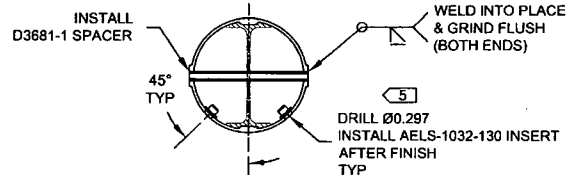
RELEASED



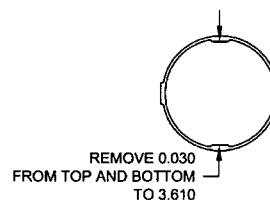
NO. 45
WORK ORDER
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
RETURN TO
SHOP COPY



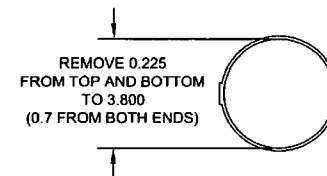
SECTION G-G
SCALE 5X



SECTION H-H
SCALE 5X



SECTION X-X
SCALE 5X



SECTION Y-Y
SCALE 5X



D3391-023 MID TUBE ASSEMBLY PARTS LIST

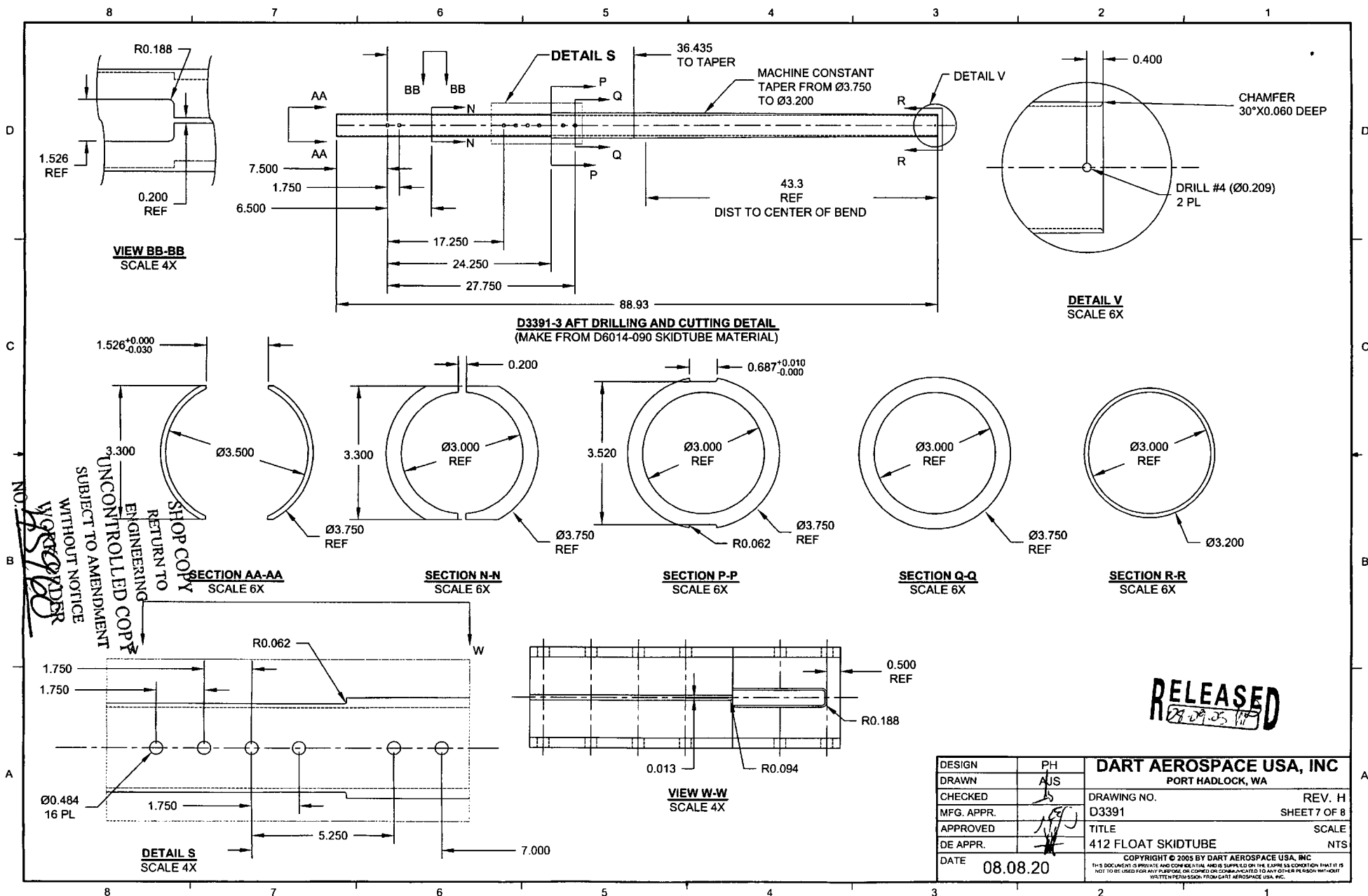
QTY - 023	PART NUMBER	DESCRIPTION
X	D3391-023	MID TUBE ASSEMBLY
1	D2500-1-100	EXTRUSION
1	D3389-1	WEB
5	D3681-1	SPACER
20	AELS-1032-130	INSERT

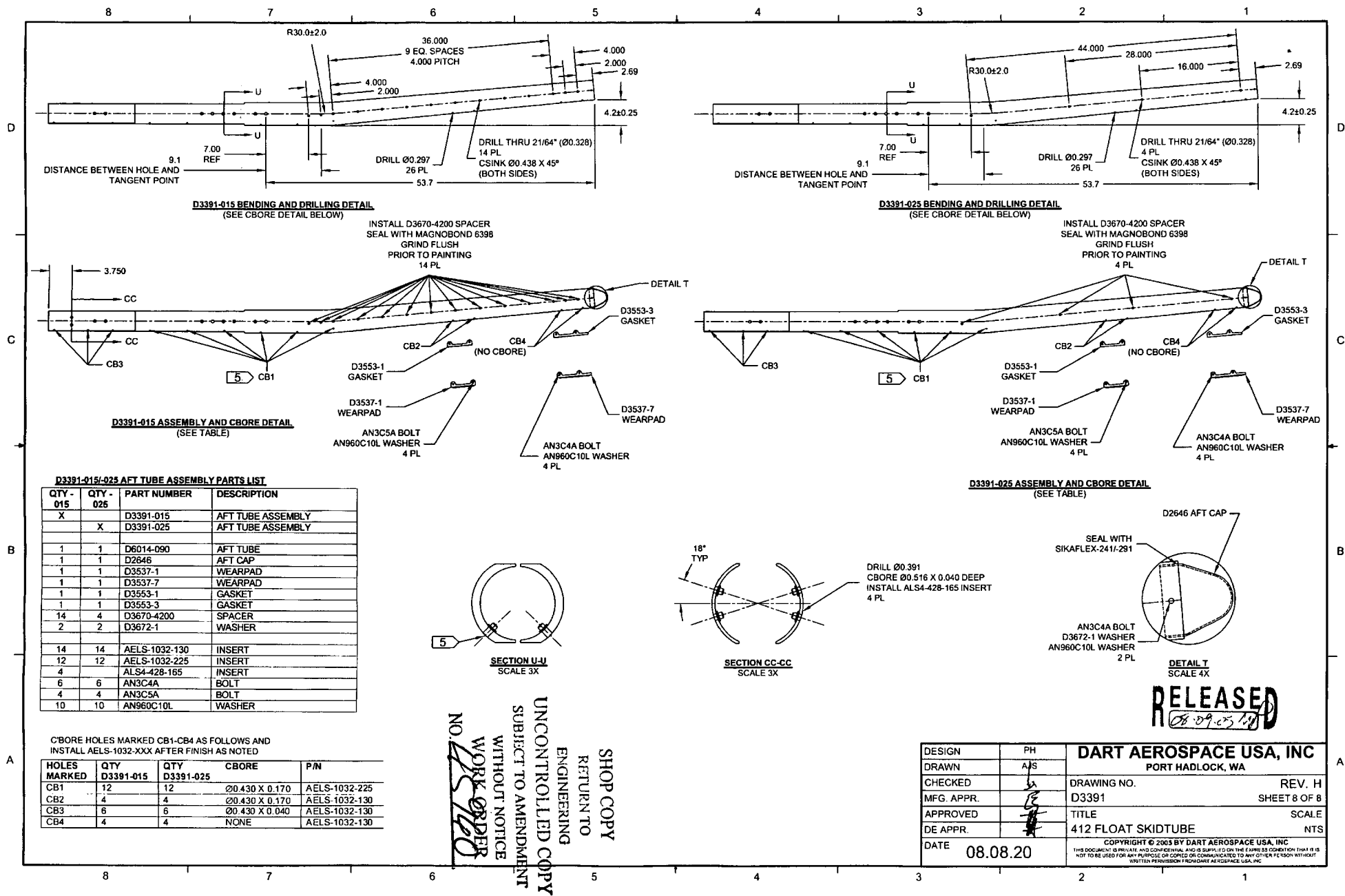
D3391-023 MID TUBE ASSEMBLY

- 1) MATERIAL: MAKE FROM D2500-1-100 EXTRUSION
- 2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-241/-291 PER QSI 015
- 3) WELDING: PER DART QSI 004

RELEASED
08-05-17

DESIGN	PH	DART AEROSPACE USA, INC	
DRAWN	AS	PORT HADLOCK, WA	
CHECKED		DRAWING NO.	REV. H
MFG. APPR.		D3391	SHEET 6 OF 8
APPROVED		TITLE	SCALE
DE APPR.		412 FLOAT SKIDTUBE	NTS
DATE	08.08.20	COPYRIGHT © 2005 BY DART AEROSPACE USA, INC	
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NO. 188

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 43170
Part number: 13391023
Description: Mid tube
Welding Process: Tig ☒ Mig ☐ I
Base material: Aluminium
Current: AC ☒ DC ☐

TEST REQUIREMENTS AND RESULTS

Visual: pass ☒ fail ☐
Penetration: pass ☒ fail ☐

UNACCEPTABLE

Cracks: pass ☒ fail ☐
Undercut: pass ☒ fail ☐
Pin holes: pass ☒ fail ☐
Overlap (cold lap): pass ☒ fail ☐
Porosity (surface): pass ☒ fail ☐
Coloration: pass ☒ fail ☐

Qualifier Pat Duval Date of Test Coupon 09-01-21

Welder Barclay Elliott Date of Test Coupon 09-01-21

The above named individual is qualified in accordance with AWS D17.1.2001 to weld